

Review of: "Inhibiting Efflux Pumps and Resistance Mechanisms: A Mini Review"

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Potential competing interests: No potential competing interests to declare.

Title: Review and Comments on "Efflux Pumps and Antibiotic Resistance: Mechanisms, Strategies, and Challenges" by Thualfakar Hayder Hasan, Ali Abdul Hussein, and Ahmed Abduljabbar Jaloob Aljanaby

General Comments:

The article provides a comprehensive overview of the role of efflux pumps in antibiotic resistance, exploring various aspects from their mechanisms to inhibition strategies. The inclusion of case studies and a focus on challenges and future perspectives adds depth to the discussion. The writing is clear, engaging, and effectively communicates complex concepts to a broad audience.

Specific Comments:

- The title is informative but could be more concise. Consider streamlining it for better readability without losing essential information.
- The abstract succinctly captures the essence of the article. However, it might benefit from a brief mention of the importance of the research in a clinical context and potential implications for public health.
- The analogy in 1.1 is engaging, but it may be helpful to briefly state the consequences of antibiotic resistance to emphasize its significance.
- The narrative flow is excellent, making the complex topic accessible. The party analogy is creative and aids in understanding the resistance mechanisms.
- The comparison of efflux pumps to a bacterial dance crew is clever, but ensure that metaphors do not compromise scientific accuracy.
- The use of metaphors in 4.1 is effective. However, consider a brief explanation of how EPIs interfere with efflux pump activity for readers less familiar with the topic.
- The introduction of combination therapy is well-placed and provides practical insights. Consider briefly explaining how this approach enhances drug efficacy.
- The challenges outlined are comprehensive. It might be beneficial to elaborate on how advancements in technology, such as AI and machine learning, could aid in identifying novel targets.
- The inclusion of both successes and failures adds balance. Ensure that the lessons learned from failures are clearly articulated to guide future research.
- The conclusion effectively summarizes key points. Consider adding a sentence on the global impact of antibiotic

resistance and the urgency of finding solutions.

- The repeated section heading (9. Conclusion and Implications for Combating Antibiotic Resistance) may be an error. Please review and correct if needed.

Overall Impression:

The article is a well-structured and informative piece that effectively communicates a complex topic. The incorporation of analogies and case studies enhances engagement, and the inclusion of challenges adds realism to the discussion. Minor adjustments in titles, metaphors, and clarifications could further improve the article's overall effectiveness.